The first three headings cover a discussion of articles on Rooks by Gilmour, Rörig, Schleh, and Hollrung, in which the results of stomach examinations are set forth and commented upon. The distribution of Rooks in Denmark is considered in detail and is illustrated by a map which shows the location of breeding colonies, and also localities where Rooks are definitely reported not to breed. It appears that Rooks are confined to the eastern part of the kingdom.

Seven pages are taken up with the reproduction of letters giving experience with injuries by the Rooks. This testimony is then summarized. The principal damage seems to be to seed grain, potatoes, and turnips. Grain is pilfered from shocks as well as from newly planted fields, and both seed potatoes and the young tubers are dug out and devoured. Although Rooks visit patches of young turnip plants in search of insect larvæ they do more harm than good by trampling down and killing the tender seedlings. The birds do minor damage by scratching manure away from plants, by general depredations in out-lying gardens, by stealing cherries, robbing partridge nests, and digging up seeds in forest nurseries.

The author's conclusion is that the Rook is an important injurious species, responsible for an annual loss to the agriculturists of Denmark, which must be reckoned in hundreds of thousands of crowns (crown = 26.8 cents). Some individuals lose thousands of crowns but the loss falls mainly upon the small holders. It is evident, he says, that the Rook is a bird which we must combat.

Among methods of fighting Rooks those recommended as most effective are taking the eggs and young from the nests, and felling trees containing nesting colonies. Shooting through the nests in the evening after the birds have gone to roost also is advised, and the author naively remarks that this is particularly disagreeable to the Rooks. The adults leave and the young die.

The article closes with a section on legislation against Rooks and a bibliography of 17 titles.— W. L. M.

Huntington's 'Our Wild Fowl and Waders.' [1]— It is apparent to all who have given much thought to the matter, that there can be but one ultimate result of the time-worn American system of protecting game only by restrictive legislation, and that result is extermination of the game. Of what avail is it to shorten the season or to reduce the bag limit, when the number of hunters greatly increases every year? Manufacturers of guns and ammunitions expend fortunes in extending their business, but they as well as the gunners themselves must be made to realize that there is a limit to the increase of hunting. If they push blindly forward to that limit, both business and sport, insofar as they depend on the existence of game birds, will vanish.

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[1] Huntington, D. W. Our Wild Fowl and Waders. Amateur Sportsman Co., New York. Dec., 1910. 207 pp.

Of earlier origin than any system of game laws is the idea that wild life may freely be drawn upon at either the need or the pleasure of man. Savages secure a great part of even their vegetable food from nature, but how shiftless a man would be considered who would depend upon the same source now. The early settlers of America found game in apparently inexhaustible abundance, and naturally used it freely. The idea has largely persisted that we have a right to take game at any time for food, but this fallacy should be as apparent as the older one of depending upon wild vegetable products. The mere acceptance of the civilized state carries with it the principle that one has no right to food which he has not helped (either directly or by equivalent) to produce.

A very high percentage of the shooting of North American wild fowl and waders is in no wise necessary to supply food (the shooters being chiefly overfed rather than the reverse). Being undertaken solely in the name of sport, the disastrous effects of this gunnery upon the game birds, and the practical failure of the sportsmen to do anything toward the increase and preservation of birds are wholly inexcusable.

Mr. Huntington points out the hopelessness of game laws to restore game, shows how the restriction of the best breeding grounds for ducks makes it impossible for them to bear up under the increasing slaughter, and devotes most of his pages to instructions for making game locally abundant, by which means the utter extinction of many species can be prevented. The author terms his book the first "for American readers on the practical conservation of game. It deals with the methods of propagation and preservation which are essential to make game abundant and keep it plentiful in places where field sports are permitted."

Mr. Huntington drew his inspiration, he tells us, from the discovery of English game keepers that "the wild duck could be preserved and made abundant for sport and for profit by the hand-rearing process, which was known to work well with pheasants and other game....More than ten thousand ducks were reared in a season at Nethelby Hall, and the skilled gamekeeper who achieved this remarkable success proved that big bags of ducks can be shot safely every season." This success has already been approached on American preserves. The author thinks that "the breeding of wild ducks should interest the farmers as well as the sportsmen, since so many small swamps and waste places can be utilized for profit."

A chapter is devoted to a general consideration of ducks, geese and swans, in which is pointed out the adaptability of the various species to artificial propagation. The following rather lengthy chapter gives evidence of the practicability of rearing large numbers of ducks in an essentially wild state and describes some successful preserves. It is shown that wild ducks will breed in close proximity to some of the most disturbing features of civilization, if only their little home shelter is secure. Freed from meddling they go along contentedly with their family cares in the most unlikely places. The best types of ponds, cover and fencing are described. The following American game farms are mentioned: Oak

Park, Ill.; Yardley, Pa.; Clifton Forge, L. I.; Hudson Highlands, N. Y.; and Chincoteague Island, Va. Stock can be secured from these and from English preserves.

Rather scanty information on the natural foods of wild ducks was available to the author, but the addressses of the principal dealers in the better known plants are given, as is also an interesting letter from Dr. R. V. Pierce, who has experimented extensively with the propagation of aquatic plants which are eaten by ducks. Many of the scientific names in this chapter are misspelled, and in discussing publications of the Bureau of Plant Industry, on wild rice, the unguarded statement is made that "It seemed hardly worth while for one department of the Government to issue expensive bulletins telling the people how to produce foods for breeders when another department was actively interested in game laws prohibiting such industry." This statement is negatived by a later one (p. 160) concerning "the profitable increase of game by breeders" which is as follows: "The Bureau of Biological Survey of the U. S. Department of Agriculture favors such legislation, and it seems probable that the laws soon will be amended so as no longer to prevent the profitable increase of a desirable food."

The most interesting part of the book of course is that dealing with the artificial rearing of wild ducks. The provision of suitable nesting places and the fencing out of ground vermin are mentioned among the essentials. Eggs are taken from the ducks until one or two clutches are obtained from each. These are placed under hens which are cared for in a hatching house lined with row upon row of nest boxes. About 20 to 33 eggs are laid by each duck in a season, although 119 have been laid by two ducks which were given an abundance of animal food. The ducks after furnishing 15 to 20 eggs are themselves allowed to lay and incubate a clutch. It has been found that duck eggs require a considerable supply of moisture; they are sprinkled daily and the nest is saturated just before hatching time. For this reason artificial incubators have not found favor, but the author worked out a method by which at least one satisfactory hatch was accomplished.

The young ducks thrive best when fed upon a meal containing a proportion of animal food. They are fed this meal until they are two to three weeks old, an increasing quantity of cracked corn bring added as they grow older. The young are not taken to water until seven to eight weeks old, a thorough wetting earlier usually having very bad effects.

After turning out where natural food is abundant only one meal a day is required. This should be given at an established feeding place on the water side, which is fenced against vermin. The ducks will then regard this spot as a refuge, and make it headquarters for their excursions to the surrounding country. They quickly learn to come to meals on signal, and although becoming tame as barnyard fowl on their familiar feeding grounds they are timid and wary when visiting other places.

This behavior is analagous to that of wild birds in certain of our public

parks, as at New York, Boston, and San Francisco, or such localities as Lake Worth, Fla., where certain areas are sanctuaries. So eager for protection and appreciative are the ducks, that such refuges should be made in all parts of the country.

The book fairly bristles with admonitions to keep down vermin, which is defined as "the natural enemies of game birds collectively." The term is very indefinite therefore and must be interpreted according to the prejudices of the gamekeeper concerned. Chapters are given on the natural enemies, collectively, on winged vermin and ground and water enemies. These categories include eagles, crows, hawks, gulls, owls, English sparrows, magpies and jays, the fox, coyotes, minks, weasels, raccoons, skunks, cats, rats, snakes, moles, turtles and fishes. The worst are thought to be the crow, fox, mink, weasel, cats and rats. Carp are mentioned as destroyers of duck food.

Although vermin are given too much importance in the book, the author himself evidently holds very reasonable views on the subject. It is only to be feared that these are buried in such a mass of charges against vermin that their effect will be lost. Mr. Huntington says: "The naturalists are right no doubt in saying that many species of vermin are beneficial and that they do not do as much harm as some gamekeepers imagine they do. Laws, however, which prohibit the killing of game enemies should not apply to game farms and preserves." It should be added, nor should bird protection laws of any kind fail to provide for the relief of property manifestly being damaged. The author well says that "it would be quite as logical to say that the shepherd must not kill the wolves as it is to say that the breeder of game must not control the enemies which kill his game." The matter should, however, be the subject of sufficient supervision to prevent abuses.

"The idea that it is not necessary or desirable to exterminate all vermin seems to be gaining ground.... A good rule to follow is to control the natural enemies of game only when they appear to be doing serious damage. A hawk trap recently has been invented in England which captures the hawks alive. The hawks which do very little damage and which are regarded as beneficial birds can be released."

Methods of destroying various pests are given, the principal one recommended for birds being use of a decoy owl and shooting from a blind. A gamekeeper at Oak Park, Ill., killed 2,410 crows in one season.

Mr. Huntington says: "The reader will find the hawks discussed at length in a bulletin issued by the United States Department of Agriculture, but in reading it he should remember that the conclusions stated are founded largely upon stomach examinations and that such evidence is not always reliable"; and adds in a footnote: "The marsh hawk is classed as a beneficial hawk by ornithologists but I shot one which had a quail in its talons as it flew overhead." Here is the old, old mistake of allowing an isolated individual observation to weigh heavily against a careful estimate formed after consideration of all the available information, to-

gether with the results of an investigation planned especially to bring out all the facts in the case. The insinuation is made that results founded upon stomach examination are essentially unreliable. The fact is that this method was adopted and is maintained principally because of the glaring insufficiency and incorrectness of field observations. It must be remembered that, given a sufficient number of stomach contents, evenly distributed chronologically and geographically, we have evidence, more exact than is obtainable in any other way, of the usual subsistence and hence of the economic significance of a species. The fact that a stomach examination reveals the nature only of a single meal, is of no importance, when a dozen or more stomachs are often collected in the same locality at about the same time.

Gamekeepers should not be too quick to disregard the findings of economic ornithologists as to the value of hawks, owls and other birds, especially as some of their worst vermin, as rats, snakes, etc., are customary food of these birds.

Mr. Huntington points out the availability of the grounds of many established ducking clubs for the purpose of propagating game, and suggests that the clubs take up the work both for their own welfare and the preservation of game birds as a group. Suggestions as to the formation of duck propagating clubs or syndicates are given, together with estimates of expenses.

A chapter entitled "The restoration of wild fowl" discusses the use of decoys for luring wild birds to ponds, and the most judicious shooting of the wild birds. It would bear more becomingly the title "The destruction of wild fowl." Description of the methods of shooting followed on preserves, so as not to drive away the ducks, nor impair the breeding nucleus, forms the subject of another chapter.

The diseases also of wild ducks are discussed and a letter on the subject from the chief of the Bureau of Animal Industry shows that the great Bear River, Utah, epidemic was coccidiosis, a result agreeing with those reached in all previous scientific investigations of epidemics among ducks in the United States.

A special chapter on propagating wild geese gives the experience of Mr. Whealton of Chincoteague Island, Va., and Mr. Warren R. Leach of Iowa (?). The shorebirds are briefly mentioned as profiting by the protective measures employed on duck preserves.

Mr. Huntington's share of the book closes with arguments for legislation favorable to game farming, and with the text of a proposed law for breeders.

An appendix contains accounts by Prof. W. W. Cooke of the distribution and migration of the principal game ducks.— W. L. M.

Papers on Tick-eating Birds.— Dr. A. Fredholm publishes in Trinidad,[1] the observations[2] of Newstead on the natural enemies of ticks in

[1] Proc. Agr. Soc. Trinidad, X. Part 7, July, 1910, pp. 258–263.

[2] Bull. Jamaica Dept. Agr., Vol. I, No. 3, April, 1910, pp. 161–165.